REMARKS

In the Office Action mailed May 16, 2004, the Examiner rejected all the pending claims under 35 C.F.R. § 103(a). Applicants respectfully traverse the rejections and request reconsideration. As described in more detail below, the pending application claims a system and method for measuring intelligibility of individuals. That is, the claimed invention measures how well speech produced by an individual can be understood by other people. In contrast, the references cited are directed towards improved speech recognition systems or verification of transcriptions. While these references share some of the same elements with the claimed invention, they do not teach, either alone or in combination, objectively measuring intelligibility of human speech communication, as claimed.

The Examiner rejected claims 1, 2, 4-8, 11-18, 24, 26, 28, 29, 32, 33, 36, 37, 42, 44, and 45 under 35 C.F.R. § 103(a) as being obvious in light of the combination of U.S. Patent No. 5,634,086 ("Rtischev") and U.S. Patent No. 6,122,614 ("Kahn"). In claims 1, 11, 21, 36, and 45, applicants recite a system for measuring intelligibility. The system includes a human listener that hears a speaker repeating items. The listener does not know what the items are prior to hearing the speaker repeating the items. The listener then prepares a transcription of what the listener heard. The system also includes a means for automatically comparing the items and the transcription, and a means for measuring intelligibility.

Similarly, in claim 24, applicants recite a method for measuring intelligibility. The method includes obtaining responses from a speaker repeating items and presenting the responses to a human listener. The listener does not know what the items are prior to hearing the speaker repeating the items. The listener creates a transcription of what the

listener heard. Accuracy is measured by automatically comparing the items and the transcription. The intelligibility of the speaker is determined based on the measurement.

The Office Action states that Rtischev teaches a means for preparing a transcription of what was heard, but acknowledges that Rtischev does not explicitly teach a human listener preparing a transcription without prior knowledge of the text that is being spoken. (See Office Action, pages 1-2.) The Office Action further states that Kahn teaches a human operator transcribing an audio file and performing a secondary comparison between the audio file and the initial transcription. (See Office Action, page 2.) The Office Action then concludes that it would have been obvious to one of ordinary skill in the art to modify the teachings of Rtischev with operator based transcription and double-checking because it would advantageously allow for human interpretation of the audio file without tying up time resources of the user themselves. (See Office Action, page 2.)

As described below, applicants respectfully disagree with the Office Action's conclusion. In addition, even if the conclusion were to be accepted, applicants' intelligibility measurement system and method is not rendered obvious by simply "modify[ing] the teachings of Rtischev with operator based transcription and double-checking." Furthermore, it is improper to combine Rtischev and Kahn in the manner suggested in the Office Action. Finally, even if combined, neither Rtischev nor Kahn shows or suggests a means for measuring intelligibility by automatically comparing items to a transcription of a speaker repeating the items, where the transcription is prepared by a human listener.

Applicants submit that it is improper to combine Rtischev and Kahn. Rtischev teaches administering a lesson in an interactive manner (see, e.g., Rtischev, Abstract), where the user of the system is paced through a lesson using a finite state machine ("FSM"). (See,

e.g., Rtischev, column 6, lines 6-11). Kahn, on the other hand, shows a system and method for automating transcription services, where, during a training period, input from a human transcriber is used to improve the accuracy of a speech recognition program. (See, e.g., Kahn, Abstract.) There is nothing in Rtischev suggesting that it might be desirable to manually train a speech recognition program, such that one would be led to Kahn. Nor is there anything in the description of Kahn's automated transcription method that would provide motivation for one to consult Rtischev's interactive lesson system. It is not enough that both references utilize some manner of speech recognition; the references must themselves include the requisite suggestion that would lead from one to the other. In this case, it appears that such a connection would only be made in hindsight by one with knowledge of the applicants' invention.

Nonetheless, even if the references are combined, they fail to show or suggest the invention as claimed. For example, neither Rtischev nor Kahn shows or suggests "a human listener hearing a speaker who is repeating items . . . wherein the listener prepares a transcription of what the listener heard," as recited in claim 1. In other words, the addition of a human transcriber to the system of Rtischev fails to morph the system of Rtischev into an intelligibility measurement system, i.e. a system that provides a measure of how well a speaker can be understood by another individual.

In Rtischev, the FSM determines whether the user is pausing at appropriate times (i.e., at the end of a sentence) and whether words are being read correctly. The FSM responds interactively to the user input with an aural or visual response, such as "okay," "Please read from P(i)," or "No, the sentence is S(i)," as appropriate. (See, e.g., Rtischev, column 6, lines 25-53.) Due to the nature of an interactive lesson, a human listener that

prepares a transcription would be unsuitable for Rtischev's system, and no such listener is suggested in Rtischev. For example, it is unclear how a human listener would be able to provide a transcription quick enough to provide interactive feedback to the user as the user is paced by the FSM through the lesson. In fact, because of the inappropriateness of using a human listener that prepares a transcription in an interactive lesson system that is driven by a finite state machine, Rtischev teaches away from the use of a human listener that prepares the transcription. Even if a human listener were incorporated into Rtischev's system, there is no mention in the cited references of measuring intelligibility, much less any suggestion in Rtischev (or Kahn) on how to then modify the Rtischev system to measure intelligibility.

In Kahn, "the system further includes means for manually inputting and creating a transcribed file based on humanly perceived contents of the voice dictation file. Thus, for certain voice dictation files, a human transcriptionist manually transcribes a textual version of the audio–using a text editor or word processor–based on the output of the audio player." (See Kahn, column 2, lines 8-14.) Because Kahn relates to automated transcription, and more particularly to training a speech recognition program in an automated transcription system, rather than a system or method for measuring intelligibility, Kahn likewise fails to show or suggest a "human listener hearing a speaker who is repeating items," as recited for example in claim 1.

Additionally, neither Rtischev nor Kahn shows or suggests a means for measuring intelligibility by automatically comparing items to a transcription prepared by a human (see, e.g., claims 11, 21, 24). Instead, Rtischev describes producing a reading quality score, which is based on a comparison of a processed speech signal and an expected response. The speech signal is processed by a system that "performs feature extraction, feeding

acoustic feature parameters to a model searcher 44 which is built around a hidden Markov Model model set." (See Rtischev, column 5, lines 9-12.) Aside from the differences between Rtischev's reading quality score and the claimed measure of intelligibility or intelligibility score, at the very least Rtischev fails to show or suggest using a transcription to produce a reading quality score.

Nor does Kahn suggest deriving an intelligibility measure from a transcription. While Kahn describes the use of human translators to produce a transcribed file or a verbatim file, Kahn is silent with respect to measuring intelligibility. Kahn is silent with respect to measuring intelligibility because Kahn's goal is to train a speech recognition program. Once a speech recognition program has been trained to a specific user, a digital audio file recorded by the user is automatically converted to a verbatim file. (See, e.g., Kahn, column 10, lines 48-57.) As Kahn's goal is to automate transcription services, Kahn is focused on improving the accuracy of the speech recognition program, and not on measuring intelligibility. Thus, Kahn does not show or suggest measuring intelligibility.

Because neither Rtischev nor Kahn show or suggest i) a means for measuring intelligibility or ii) a human listener that hears a speaker repeating items and prepares a transcription of what the listener heard, the combination of Rtischev and Kahn does not show or suggest each and every element of any of claims 1, 11, 21, 24, 36, and 45. Accordingly, claims 1, 11, 21, 24, 36, and 45 are not obvious in light of the combination of Rtischev and Kahn.

Claims 2 and 4-8 depend from claim 1. Claims 12-18 depend from claim 11. Claims 26, 28, 29, 32, and 33 depend from claim 24. Claims 37, 42, and 44 depend from claim 36. Accordingly, applicants also submit that claims 2, 4-8, 12-18, 26, 28, 29, 32, 33, 37,

42, and 44 are not obvious in light of the combination of Rtischev and Kahn for at least the reasons described with respect to claims 1, 11, 24, and 36.

The Examiner also rejected claims 9, 10, 19-23, 34, 35, 38, 40, 41, and 43 under 35 C.F.R. § 103(a) as being obvious in light of the combination of Rtischev, Kahn, and U.S. Patent No. 5,059,127 ("Lewis"). Claims 9 and 10 depend from claim 1. Claims 19 and 20 depend from claim 11. Claims 22-23 depend from claim 21. Claims 34 and 35 depend from claim 24. Claims 38, 40, 41, and 43 depend from claim 36.

As described above, even if combined, the combination of Rtischev and Kahn does not show or suggest a means for measuring intelligibility by automatically comparing items to a transcription prepared by a human hearing a speaker who is repeating items. Lewis was cited for the teachings of evaluating difficulty of the items, the ability of a listener, using Item Response Theory, and a database containing data from previous evaluations. (See Office Action, pages 3-4.) However, these citations to Lewis fail to overcome the above-noted deficiencies in Rtischev and Kahn. Accordingly, for at least the foregoing reasons, applicants submit that claims 9, 10, 19, 20, 22, 23, 34, 35, 38, 40, 41, and 43 are not obvious in light of the combination of Rtischev, Kahn, and Lewis.

In light of the above remarks, applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103(a).

CONCLUSION

In light of the above remarks, applicants submit that the present application is in condition for allowance and respectfully request notice to this effect. The Examiner is

requested to contact applicants' representative below if any questions arise or if she may be of assistance to the Examiner.

Respectfully submitted,

Ordinate Corporation

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By: Lisa Schoedel

Lisa M. Schoedel
Reg. No. 53,564
McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606-6709
312 935 2362
schoedel@mbhb.com